

# Literacy and numeracy: crucial foundations required for building the bridge to personal transformation

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# Outline

- Introduction
- Literacy and numeracy in the 21<sup>st</sup> century
- What do we know about the literacy and numeracy skills of adults, including incarcerated adults?
- Why are literacy and numeracy skills crucial foundation skills?
- The ACSF - our standards for L&N – and Spiky Profiles
- Some of the challenges and solutions in building bridges to personal transformation
- Q&A?

# L&N in the 21<sup>st</sup> century

## New Work Smarts: Skills that matter most



Smart  
Learning

- learn (be a lifelong learner)
- solve problems
- think critically
- use science and mathematics skills
- use verbal communication and interpersonal skills
- have an entrepreneurial mindset

Smart  
Thinking

Smart  
Doing

# L&N in the 21<sup>st</sup> century

It is time to bring the VET sector back to the forefront as the key strategy to **ensuring Australia's workforce has the skills required by employers and industry...**



TAFE Queensland. *The VET Era: Equipping Australia's workforce for the future digital economy*, 2016, p.1

Accessed from: <http://tafeqld.edu.au/resources/pdf/about-us/research-papers/vet-era.pdf>

# L&N in the 21<sup>st</sup> century



**OECD Skills Outlook 2013**  
FIRST RESULTS FROM THE SURVEY  
OF ADULT SKILLS



“ ... the demand for information-processing skills and other high-level cognitive and interpersonal skills is growing. **In addition to mastering occupation-specific skills, workers in the 21st century must also have a stock of information-processing skills, including literacy, numeracy and problem solving, and “generic” skills, such as interpersonal communication, self-management, and the ability to learn,** to help them weather the uncertainties of a rapidly changing labour market. ”

OECD (2013). *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*, OECD Publishing. <http://dx.doi.org/10.1787/9789264204256-en>

# L&N in the 21<sup>st</sup> century



# L&N in the 21<sup>st</sup> century



Not just the 3 R's of **basic** reading, 'riting and 'rithmetic

Not just low level skills – a continuum from low level (beginning primary school) through to a very high level – up to Diploma/Uni levels.

Work and life in the 21<sup>st</sup> Century demands higher level L&N skills.

# L&N in the 21<sup>st</sup> century – Foundation skills



Core Skills for Work			&	Australian Core Skills Framework
Navigate the world of work	Interact with others	Get the work done		Reading
<ul style="list-style-type: none"><li>a. Manage career and work life</li><li>b. Work with roles, rights and protocols</li></ul>	<ul style="list-style-type: none"><li>a. Communicate for work</li><li>b. Connect and work with others</li><li>c. Recognise and utilise diverse perspectives</li></ul>	<ul style="list-style-type: none"><li>a. Plan and organise</li><li>b. Make decisions</li><li>c. Identify and solve problems</li><li>d. Create and innovate</li><li>e. Work in a digital world</li></ul>		Writing
				Oral Communication
				Numeracy

**Learning underpins everything!**



# L&N in the 21<sup>st</sup> century

There has been a lot of interest in LLN in the 21st Century. For example, in the 2011 report, *No more excuses*, the Industry Skills Councils proposed:

- better identification of the LLN skills of learners before training, and targeted funding to address identified LLN skill gaps
- the inclusion of clear advice on LLN skill requirements in Training Packages and/or their companion volumes
- the implementation of a strategy to develop greater national awareness of LLN issues, including the de-stigmatisation of LLN skill development
- an increased capacity in the VET system, and all practitioners, to support the LLN skill development needs of learners and workers
- better-targeted solutions for building the LLN skills of workers/learners.

# L&N in the 21<sup>st</sup> century



There has been a lot of interest in LLN in the 21st Century. For example, in the 2011 report, *No more excuses*, the Industry Skills Councils proposed:

- better identification of the LLN skills of learners before training, and targeted funding to address identified LLN skill gaps **Inserted into standards – some LLN assessment tools now available**
- the inclusion of clear advice on LLN skill requirements in Training Packages and/or their companion volumes **Done for some TPs**
- the implementation of a strategy to develop greater national awareness of LLN issues, including the de-stigmatisation of LLN skill development **National Foundation Skills Strategy, but ...??**
- an increased capacity in the VET system, and all practitioners, to support the LLN skill development needs of learners and workers **TAE LLN411 unit**
- better-targeted solutions for building the LLN skills of workers/learners. **Foundation Skills Training package (FSK)**
- **But why all this interest?**

# Why? What do we know?

PISA – the Programme for International Student Assessment

&

PIAAC, the Programme for International Assessment of Adult Competencies is an international survey of adult skills

**Question:** After the “filtering” process, what percentage of the adults aged 15-74 across Australia undertook PIAAC on the computer?

# What do we know?

**In PISA: 19<sup>th</sup> out of 65 countries in numeracy (just above the mean). Compared to literacy where we are 14<sup>th</sup> and significantly above the mean.**

**In both literacy and numeracy in PISA Australia has significantly declined since 2003.**

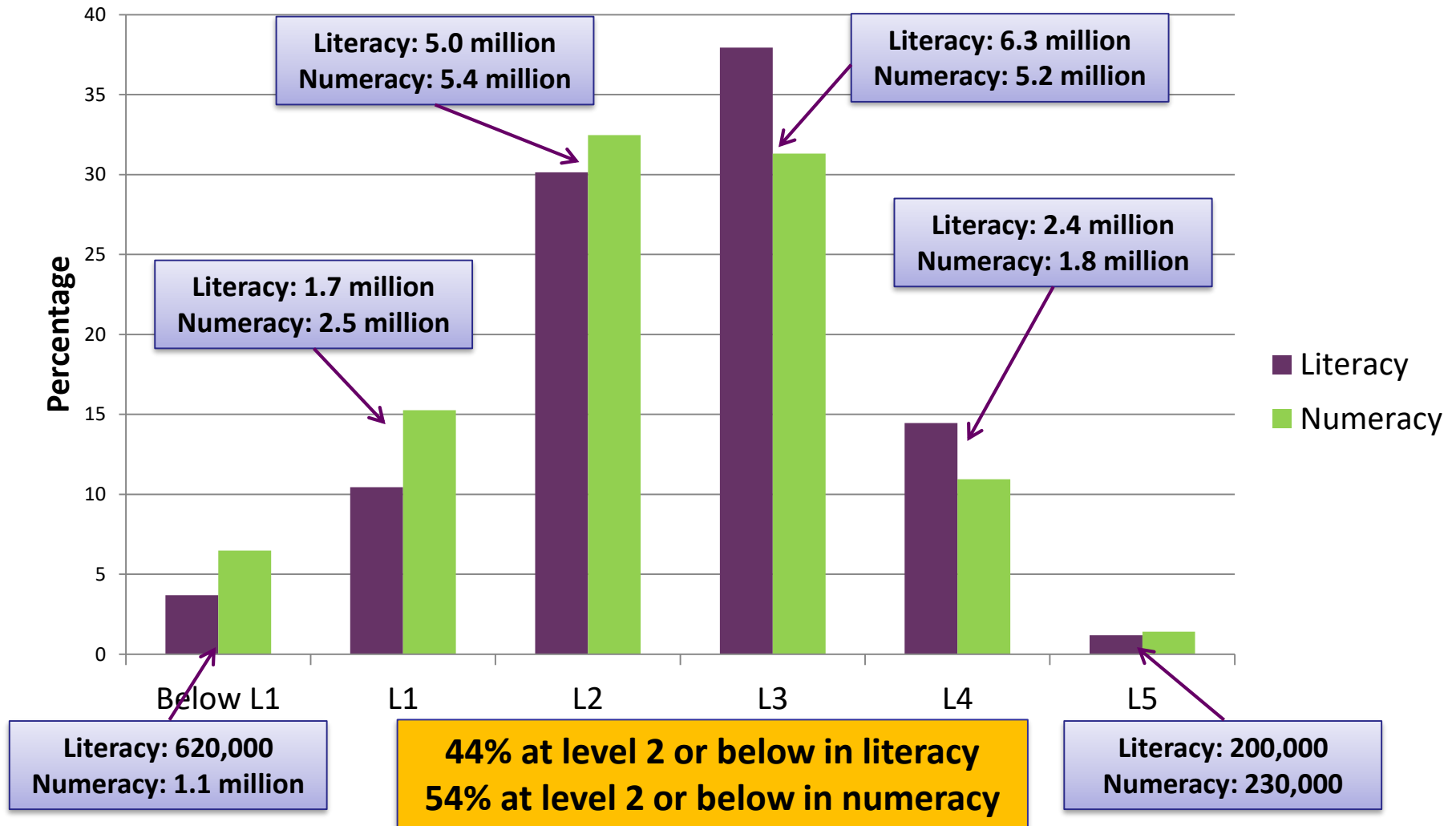
**In PIAAC: 15<sup>th</sup> out of 33 countries in numeracy (just below the mean). Compared to literacy where we are 5<sup>th</sup> and significantly above the mean.**

**In literacy in PIAAC there has been a small improvement since 2006, but a decline in numeracy.**

**Why the difference between literacy and numeracy?**

# What do we know?

## Performance by Level (15-74 yos)



Proportions of persons in Literacy and Numeracy in PIAAC. Total Australian population aged 15-74 years.

# What do we know?



**But what do these levels mean? They are not the same as the ACSF levels.**

Work in pairs, or threes, to estimate what you think are the levels of each of the six questions on your sheet.

# What do we know?



## What levels are these tasks at?

- |   |                     |
|---|---------------------|
| 1. How many bottles of coke?  | 1. Below Level 1    |
| 2. Toaster costs \$80. What is the price during the sale with a 10% discount? | 2. Level 2          |
| 3. MEDCO Aspirin – max number of days?  | 3. Below Level 1    |
| 4. If you buy a quarter of a kilogram of Olives how much will you pay?        | 4. Level 2          |
| 5. Compare the per cent of change in Dioxin level                             | 5. Level 4/5 border |
| 6. What percentage do you save during the sale?                               | 6. Level 3          |

# What do we know?



Re the number of bottles - this was a **Below Level 1** item in Numeracy.

**1.1 million Australians aged 15-74 years of age are operating at this level.**

## MEDCO ASPIRIN

500

INDICATIONS: Headaches, muscle pains, rheumatic pains, toothaches, earaches. RELIEVES COMMON COLD SYMPTOMS.

DOSAGE: ORAL. 1 or 2 tablets every 6 hours, preferably accompanied by food, for not longer than 7 days. Store in a cool, dry place.

CAUTION: Do not use for gastritis or peptic ulcer. Do not use if taking anticoagulant drugs. Do not use for serious liver illness or bronchial asthma. If taken in large doses and for an extended period, may cause harm to kidneys. Before using this medication for chicken pox or influenza in children, consult with a doctor about Reyes Syndrome, a rare but serious illness. During lactation and pregnancy, consult with a doctor before using this product, especially in the last trimester of pregnancy. If symptoms persist, or in case of an accidental overdose, consult a doctor. Keep out of reach of children.

INGREDIENTS: Each tablet contains  
500 mg acetylsalicylic acid.  
Excipient c.b.p. 1 tablet.  
Reg. No. 88246



Made in Canada by STERLING PRODUCTS, INC.  
1600 Industrial Blvd., Montreal, Quebec H9J 3P1

Re the max dosage - this was a **Below Level 1** item in Literacy.

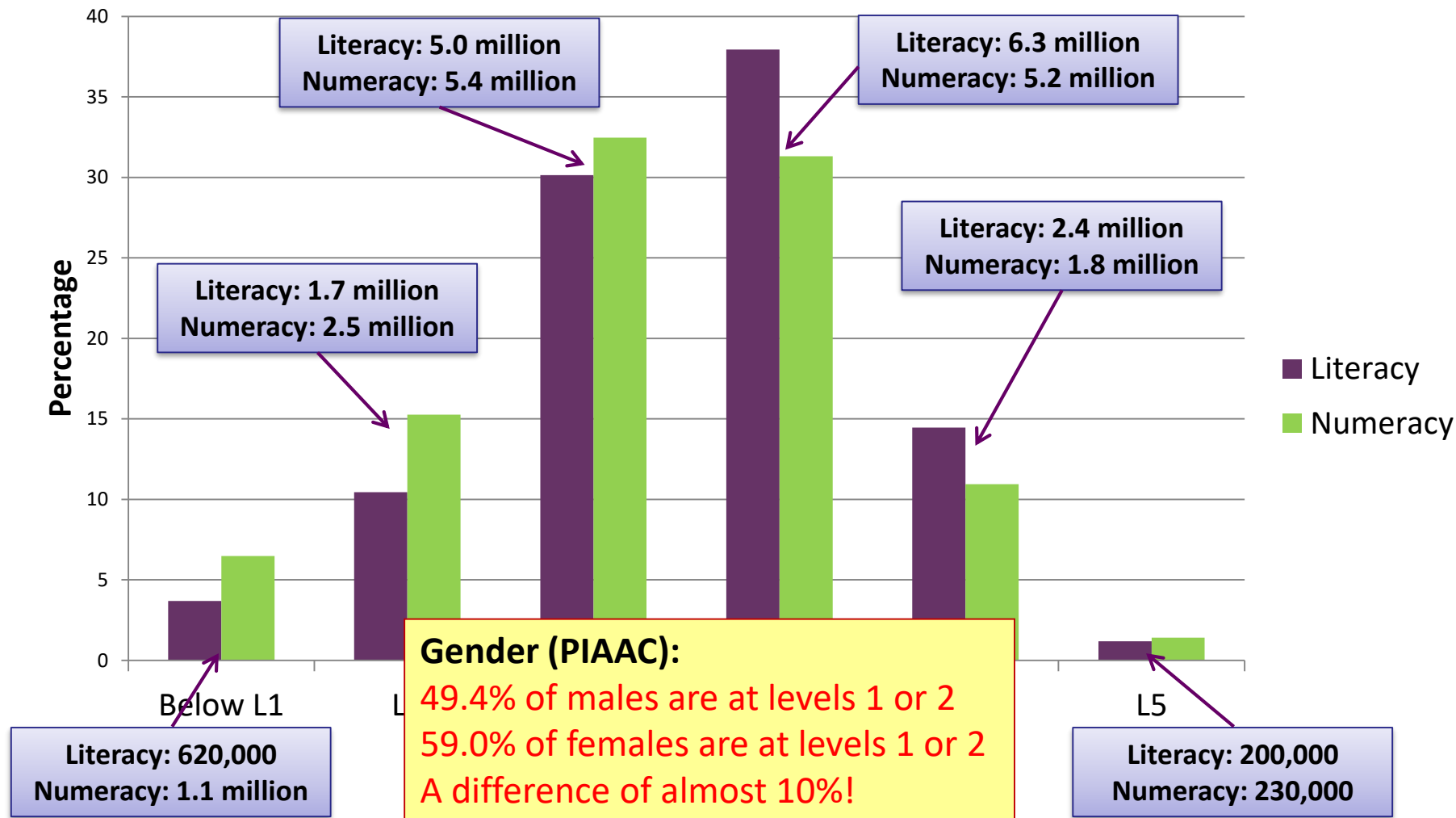
**About 620,000 Australians aged 15-74 years of age are operating at this level.**

**Is the bar set lower in numeracy?**



# What do we know?

## Performance by Level (15-74 yos)



Proportions of persons in Literacy and Numeracy in PIAAC. Total Australian population aged 15-74 years.

# Why are L&N crucial?

New Sept 2017 report out from the OECD on adult L&N challenges in Australia. Numeracy named as a major challenge esp for women. See: [http://oecdeducationtoday.blogspot.com.au/2017/09/why-it-matters-if-you-cant-read-this.html?utm\\_source=feedburner&utm\\_medium=email&utm\\_campaign=Feed:+EducationtodayBlog+\(educationtoday+blog\)](http://oecdeducationtoday.blogspot.com.au/2017/09/why-it-matters-if-you-cant-read-this.html?utm_source=feedburner&utm_medium=email&utm_campaign=Feed:+EducationtodayBlog+(educationtoday+blog))

A closer examination of Australia's performance reveals the following:

- Numeracy represents a particular challenge in Australia.
- Signs of poor numeracy performance can be traced back to initial schooling.
- Women have weaker numeracy skills than men.
- There is a relatively large gap between the most proficient and least proficient adults in literacy and in numeracy.
- Many well-educated adults have low literacy and/or numeracy skills.
- Young women in Australia are much more likely to be not in employment, education or training (NEET) than young men.

# What do we know about incarcerated adults?



## Highlights from the U.S. PIAAC Survey of Incarcerated Adults: Their Skills, Work Experience, Education, and Training

Program for the International Assessment of Adult Competencies: 2014



NCES 2016-040  
U.S. DEPARTMENT OF EDUCATION

**ies** NATIONAL CENTER FOR  
EDUCATION STATISTICS  
Institute of Education Sciences

<https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2016040>

# What do we know about incarcerated adults?



*Average scores and percentages of adults below Level 2 on the PIAAC literacy scale, by selected characteristics: 2012 and 2014*

Characteristic	Average literacy score		Percentage below Level 2 in literacy	
	U.S. Prison	U.S. Household	U.S. Prison	U.S. Household
Overall	249*	270	29*	19
Gender				
Male	249*	271	29*	19
Female	249*	269	28*	18

*Average scores and percentages of adults below Level 2 on the PIAAC numeracy scale, by selected characteristics: 2012 and 2014*

Characteristic	Average numeracy score		Percentage below Level 2 in numeracy	
	U.S. Prison	U.S. Household	U.S. Prison	U.S. Household
Overall	220*	255	52*	29
Gender				
Male	221*	263	52*	25
Female	219*	248	54*	33
Race/ethnicity				
White	242*	270	36*	19
Black	206*	216	65*	57
Hispanic	210*	222	57	52
Other	221*	257	52*	28

# What do we know about incarcerated adults?



## Consistent with New Zealand data based on their adult LN Assessment Tool:

“ ... While the lack of relationship between low literacy and re-offending risk may appear surprising, it is likely that poor literacy itself is not a criminogenic factor – that is, in the absence of true offending “drivers” (such as violence propensity, drug and alcohol dependence, impulsivity and associations with criminal others), a person with poor literacy is not necessarily at risk of becoming an offender. It seems likely instead that poor literacy (and numeracy) make it more difficult for people who are offenders to successfully achieve the transition to a law-abiding lifestyle.”

*Practice: The New Zealand Corrections Journal*, Department of Corrections / Ara Poutama Aotearoa: Vol 2, Issue 1, 2014

Australia should have the same data available – either through PIAAC or the use of the same tool across borders/boundaries?

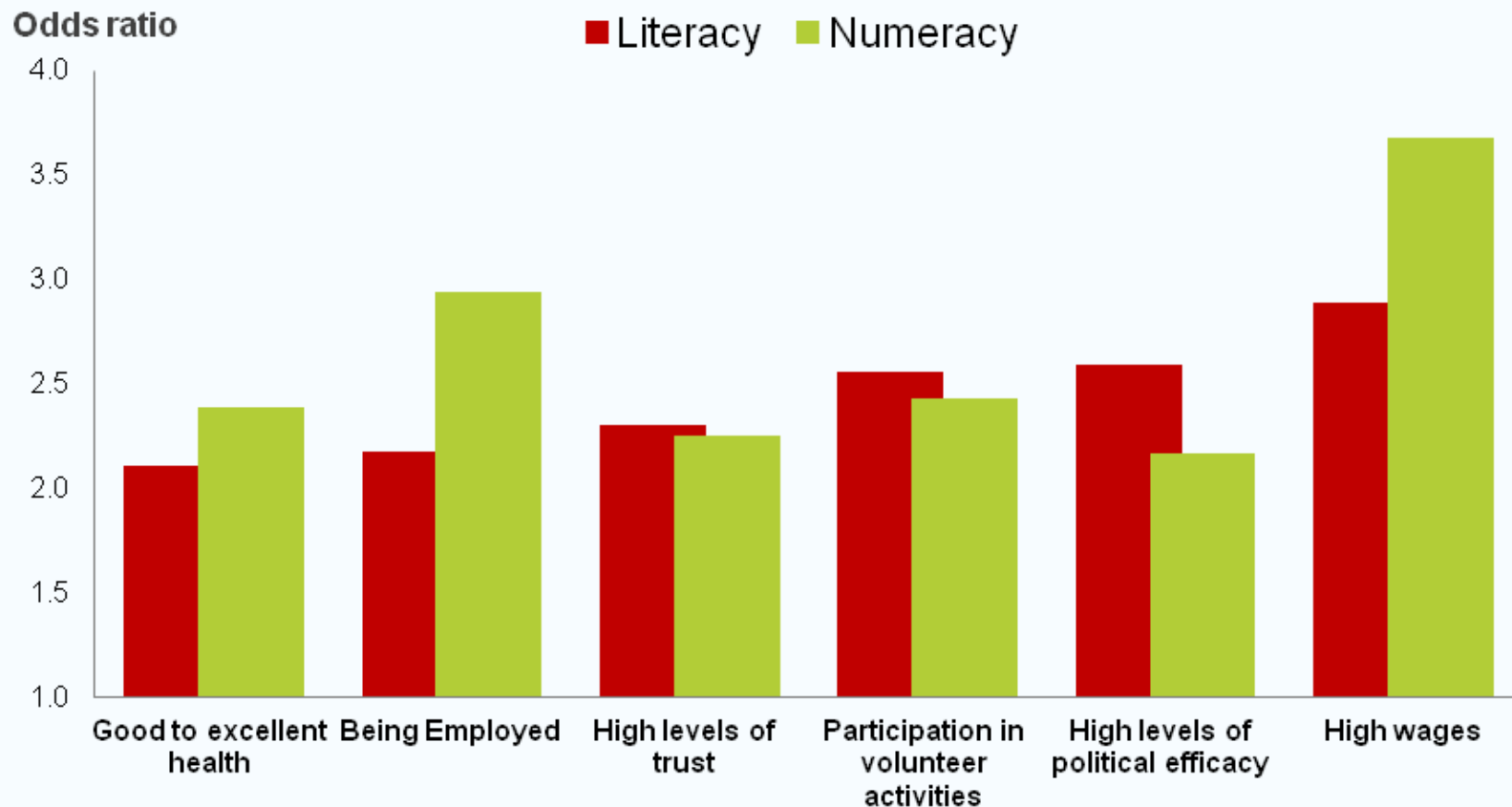
# Why are L&N crucial?

Based on three cycles of international assessments of adult literacy and numeracy skills (IALS, ALLS and PIAAC), the research indicates, amongst a number of other findings, that people with higher LLN skills are significantly **more** likely to:

- be employed
- participate in their community
- experience better health
- engage in further training
- earn more on average
- each extra year of education improves L&N skills.

Ongoing research on other countries has substantially expanded on this knowledge and understanding of the crucial role that literacy and numeracy play as underpinning skills required for successful lives – for building the bridge to personal transformation.

# Why are L&N crucial?



As an example of the analytic potential of PIAAC this graph shows that adults with high proficiencies in literacy and in numeracy are much more likely, compared to those with lower skills, to report good health, to be employed, to have higher earnings, and to have positive social dispositions and take part in community life. And that **numeracy** appears to be a more potent predictor of social and economic outcomes such as **health**, **employment**, and **high salary**, compared with literacy.

# Why are L&N crucial?

Another example:

“ ... while the impact of low literacy and low numeracy is substantial, low numeracy has the greatest negative effect, even when it is combined with competent literacy. ... Poor numeracy skills make it difficult to function effectively in all areas of modern life, particularly for women. ”

Bynner & Parsons, 2005, p. 7)



# The Australian Core Skills Framework



The Australian Core Skills Framework (ACSF) is the Australian standards for adult LLN. It can be used for:

- Mapping and benchmarking an individual's core skills performance
- Mapping core skills requirements in education and training
- Tailoring approaches to teaching and learning
- Describing core skills relevant to the workplace and employment
- Informing decisions regarding funding and referrals

Now used more extensively than anticipated

# The ACSF



The ACSF describes each of **five** core skills:

- Learning
- Reading
- Writing
- Oral Communication
- Numeracy
- **Across Five levels** of performance ranging from 1 (low level performance) to 5 (high level performance)
- 2012 version includes a pre level 1
- **Four performance variables** that may influence a person's performance at any time:
  - Support; context; text complexity and task complexity.
- **Three Domains of Communication**, broad contexts within which the core skill may be used:
  - personal and community
  - workplace and employment
  - education and training.

# The ACSF

## **If working at ACSF levels 1 and 2 (i.e. below Exit Level 2):**

- Very poor or fairly weak skills, and insufficient for a trainee or worker/citizen in the 21st Century.

## **If working at ACSF level 3 (i.e. below Exit Level 3):**

- Skills **could** be OK, depends on whether they are closer to Level 2 or to Exit Level 3. But not great for a trainee or a worker/citizen in the 21st Century and could have gaps in their LLN skills and knowledge **especially in numeracy**

## **If working at ACSF level 4:**

- Skills are probably quite strong – competent for most trainees or for a worker/citizen in the 21st Century but could have some gaps in their LLN skills and knowledge, depending on course/work requirements

## **If working at ACSF level 5:**

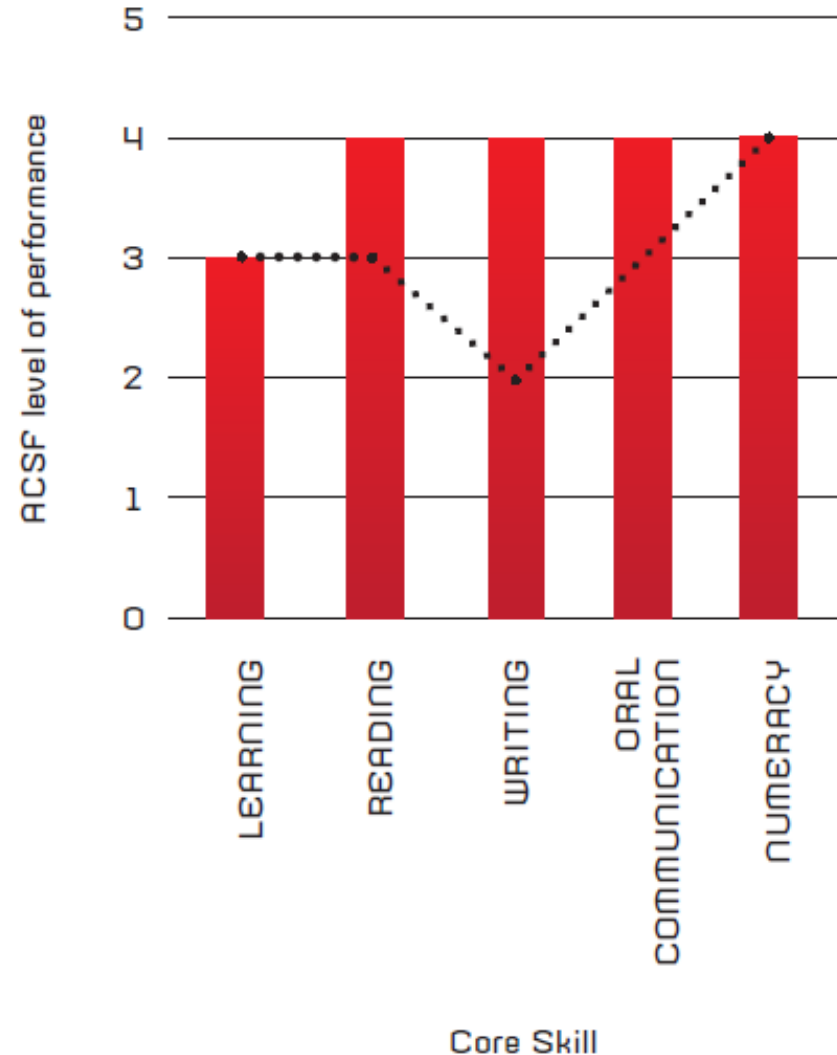
- Skills are very strong and excellent as a basis for a trainee or a worker/citizen in a wide range of fields in the 21st Century - would only need specific help if required, e.g. for higher ed course/level

# Spiky Profiles



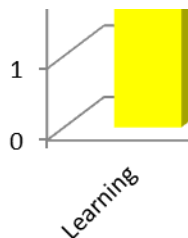
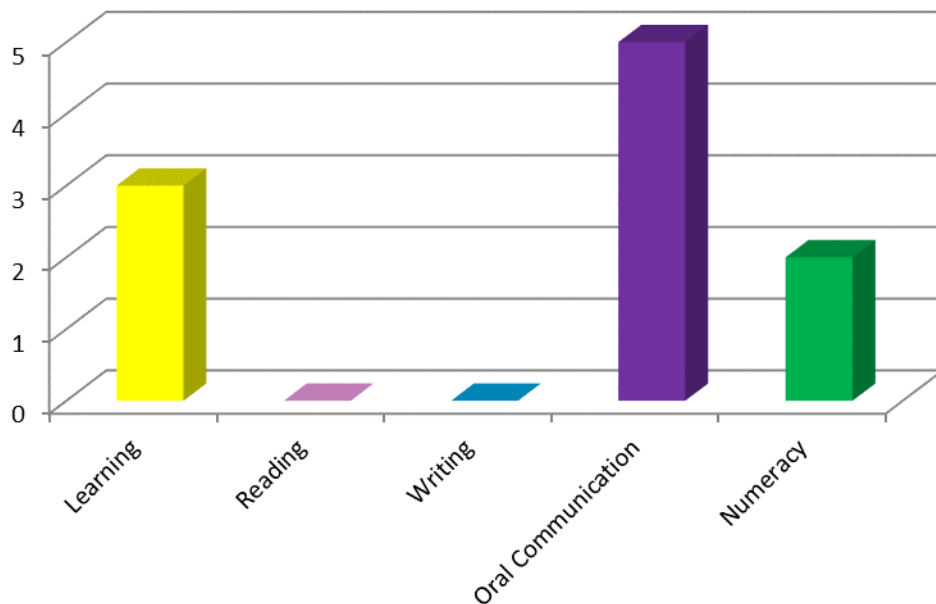
**The gap or mismatch between skills and skill requirements**

- Individuals may have spiky profiles
- Workplace or VET courses/quals may have Spiky Profiles



# Spiky Profiles – VET quals

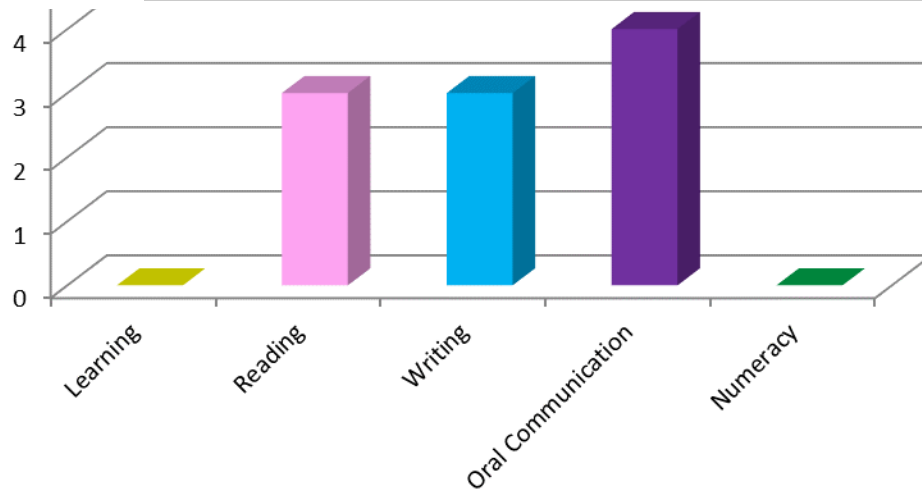
CUVPRP304 Participate in collaborative creative projects



## Visual Arts

Communicate effectively in the music industry

CUVIND401 Communicate effectively with arts professionals

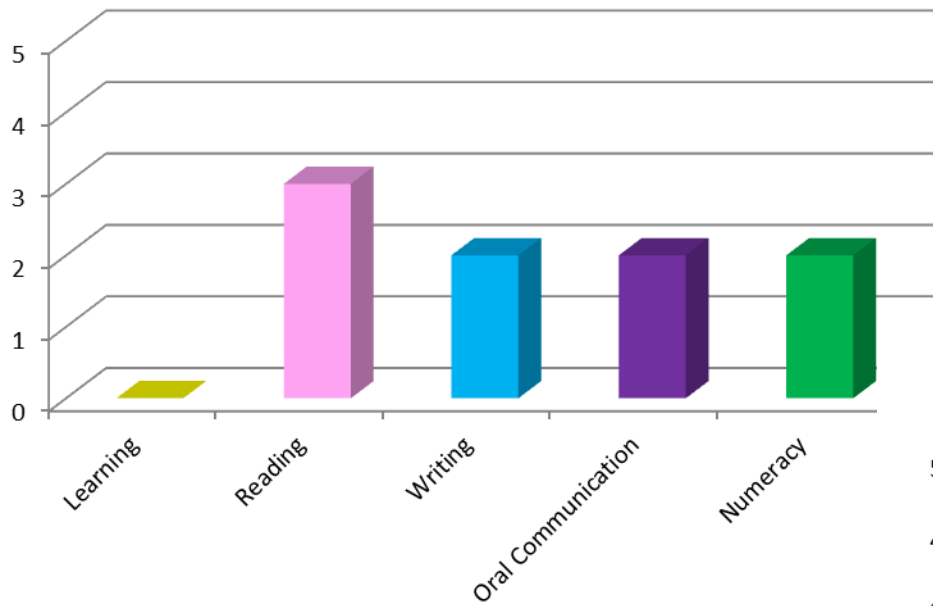


# Spiky Profiles

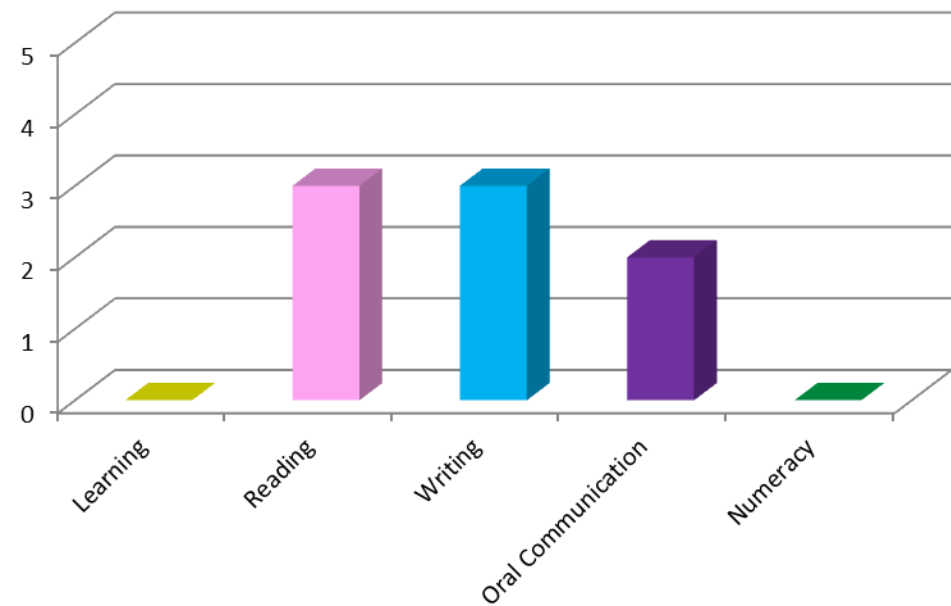


ICT

ICAICT203 Operate application software packages

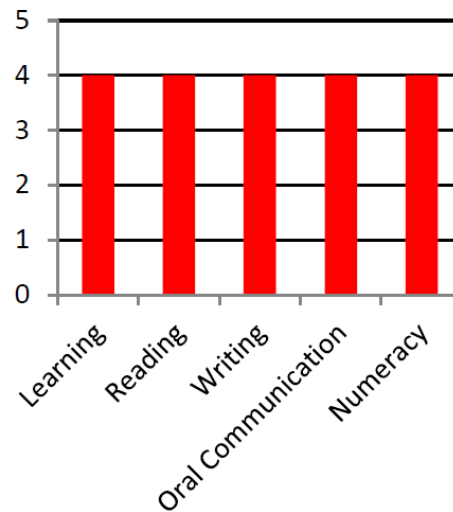
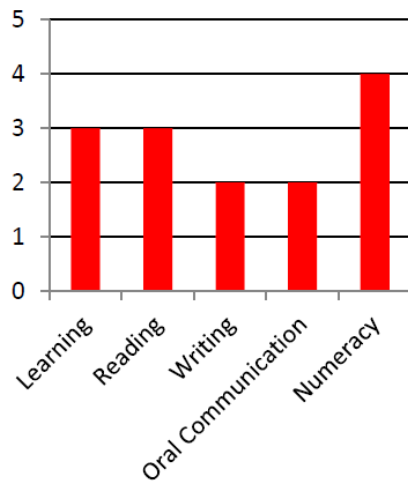
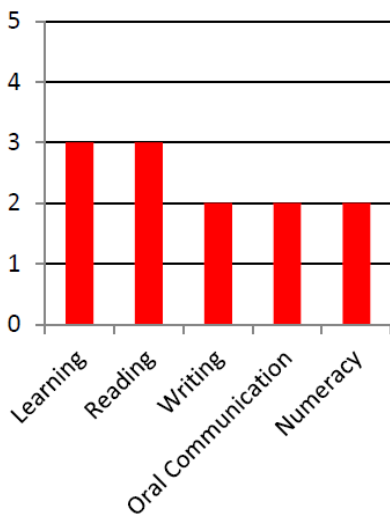
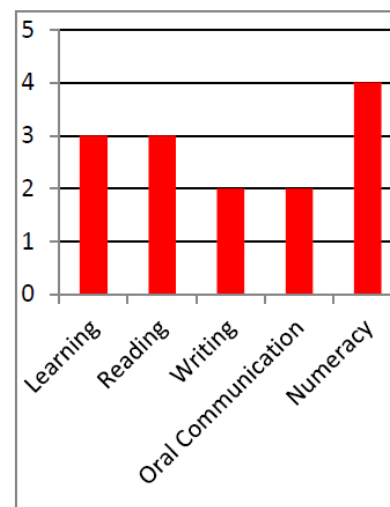
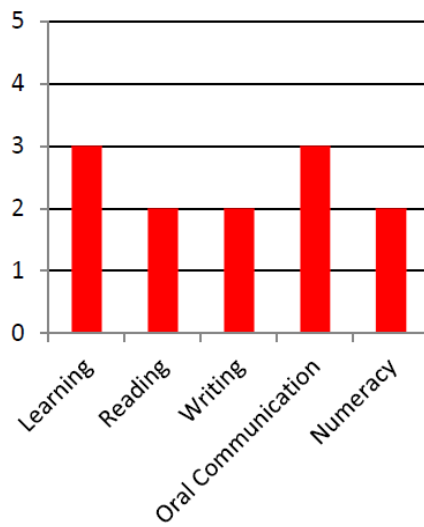
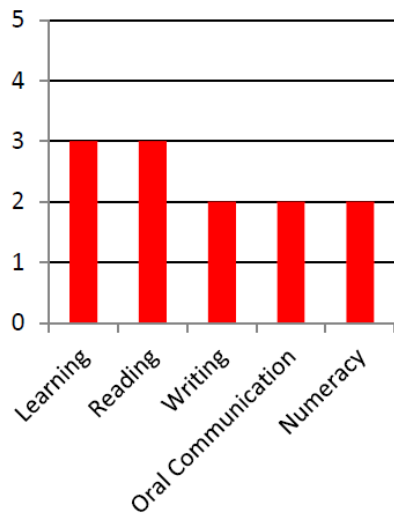


ICASAS301A Run standard diagnostic tests



# Spiky Profiles

## Resources and Infrastructure



# Challenges and solutions?

- L&N are at the core of being able to participate fully and effectively in work and community life, VET training and the workplace – essential for recidivism and therefore for transforming lives!
- There **WILL** be significant L&N problems for a wide range of young people and adults in correctional institutions
- There will often be a mismatch between skills and abilities in L&N and in the levels required in VET and industry based work
- And don't forget the N in LLN!



# Challenges and solutions?



## **Long standing aims and purposes of education and training in correctional institutions:**

- Education and training for adult prisoners and offenders can make a significant difference to successful post-offending employment outcomes and thus reduce the likelihood of re-offending
- Need to improve access to vocational education and training
- Embed literacy and numeracy education with trade training and allow prisoners to achieve nationally recognised qualifications

# Challenges and solutions?

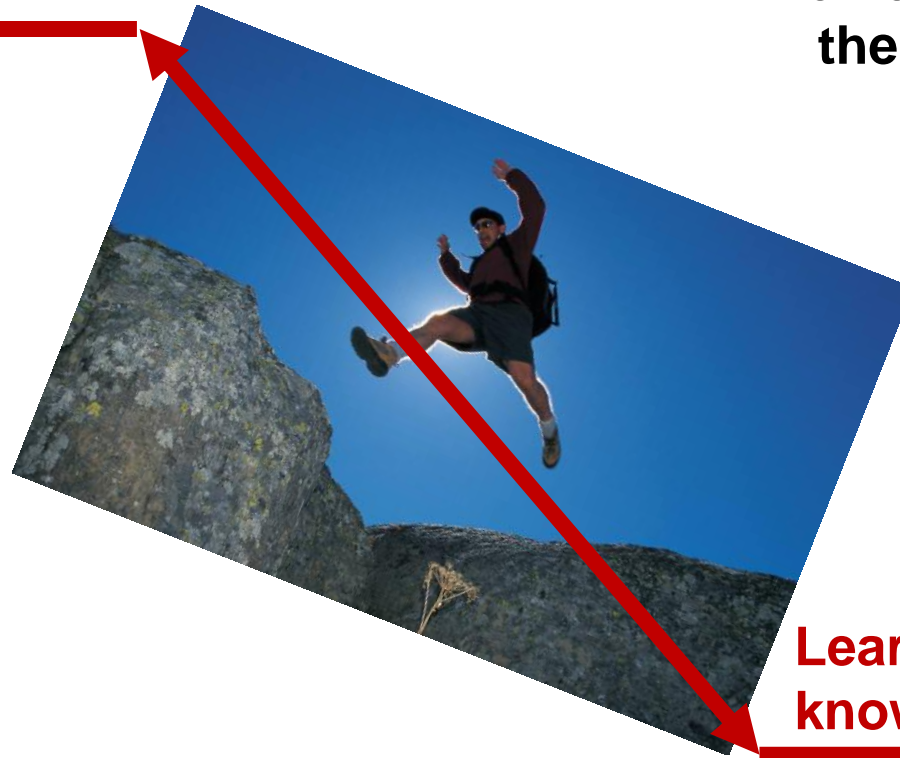
## Particular issues in VET

**Materials/manuals/etc**

**Course content**

**Assessment requirements**

**We need to bridge  
the skills gap**



**Learner skills and  
knowledge**

# Challenges and solutions?



Some key points about effective delivery of LLN in VET and workplaces include:

- Ensure that the training is relevant – make connections between L&N and VET and work
- Identify those most at risk of poor skills proficiency
- Recognise and certify skills proficiency
- Some specialist assistance required with language, literacy or numeracy skills
- Use FSK units.

# Challenges and solutions?

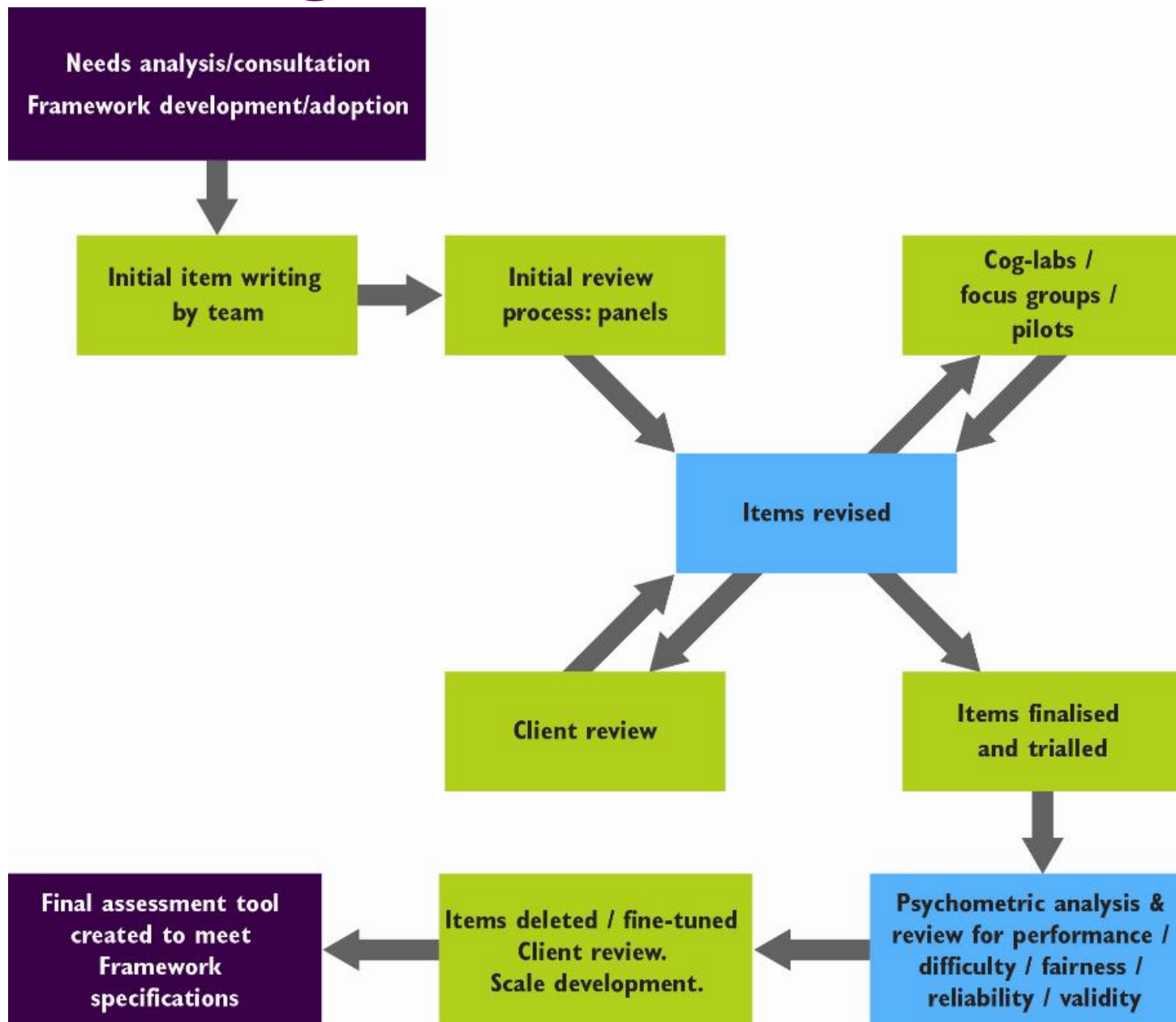
ACER is pleased to announce the launch of the Vocational Indicator, an enhanced version of our existing Compass tool. Enhancements include:

- VI better addresses the revised 2012 version of the ACSF
- Covers up to ACSF level 5 – suitable for higher ed quals
- New automated, integrated screener and branching rules for targeting the ability level of each candidate
- Makes the focus more adult and vocational
- Significantly shorter than Compass
- Updated reports
- Online Calculator in-built in for the Numeracy assessment
- ACER now has the ability to refresh and change the questions
- Future proofed – tablet, touch screen enabled
- Practice Assessment available.

 Vocational Indicator



# Challenges and solutions?



# Challenges and solutions?

Learners	Questions				
XXX					
	15				
XXXXX					
XXXXXX	9	Working at ACSF Level 5	= Exit Level 4		
XXXXXX	27				
XXXXXX	30				
XXXXXX	29				
XXXXXX	2	Working at ACSF Level 4	= Exit Level 3		
XXXXXX	20				
XXXXXX	1				
XXXXXXXXXXXXXX					
XXXXXX					
XXXXXXXXXXXXXX	16	22			
XXXXXXXXXXXXXX	26	51			
XXXXXXXXXXXXXX	4	12	19	23	31
XXXXXXXXXXXXXX					
XXXXXXXXXXXXXX					
X	13				
XXXXXXXXXXXXXX	14	Working at ACSF Level 3	= Exit Level 2		
XXXXXXXXXXXXXX	10				
XXXXXXXXXXXXXX	21				
XXXXXXXXXXXXXX	7	49			
XXXXXXXXXXXXXX	6	24	25	36	43
XXXXXXXXXXXXXX	5	47			
XXXXXXXXXXXXXX					
XXXXXXXXXXXXXX	3	17	35	38	45
XXXXXXXXXXXXXX					
XXXXXXXXXXXXXX	37				
XXXXXXXXXXXXXX	18				
XXXXXX					
XXXXXX	8	Working at ACSF Level 2	= Exit Level 1		
XXXXXX	34				
XXXXXX	53				
XXXXXX	54				
XXXXXX					
XX	33	Working at ACSF Level 1	= Not yet at level 1		
XX	55				
X	44				
X					
X					

- ACER uses a combination of empirical data **and** professional judgement
- Write explicitly to address the ACSF
- Items are written by a **team** of writers - who use professional judgement and validation processes to map the items
- The items are trialled to enable the items to be checked for performance empirically
- The items are trialled to enable the items to be scaled psychometrically in item difficulty order.
- This empirical data is used for moderating both the ACSF mapping for individual items and for the cut points on the VI scale between the ACSF levels

# Q&A



# Some references

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